

ABSTRACT

A mixed molten salt containing CaCl_2 and NaCl is held in the reactor cell 1 at a temperature not more than $600\text{ }^\circ\text{C}$. TiCl_4 which is of a Ti raw material is introduced into the reactor cell 1 while Na is introduced into the reactor cell 1. Na introduced into the reactor cell 1 is replaced by Ca, Ca is dissolved in the molten salt, Ca reduces TiCl_4 introduced into the reactor cell 1, and thereby Ti particles are generated. The generated Ti particles are introduced to a separation cell 2 along with the molten salt, and the Ti particles and Na are separated from the molten salt. The residual molten salt is introduced to an electrolytic cell 3 to generate Na by high-temperature electrolysis at the temperature more than $600\text{ }^\circ\text{C}$. The generated Na is returned to the reactor cell 1 to replenish Na consumed in the reactor cell 1. The highly reactive Ca is not directly handled, and Na which is easy to handle is used in a circulating manner. Therefore, the Ti or Ti alloy can economically be produced by Ca reduction.